



SDMS Doc ID 2019621



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 9

75 Hawthorne Street  
San Francisco, CA 94105-3901

8 September 1999

MEMORANDUM

SUBJECT: Simi Valley Perchlorate Sampling

FROM: Katherine J. Baylor, Hydrogeologist  
RCRA Corrective Action Office (WST-5)

A handwritten signature in black ink, appearing to be "KJB", written over the "FROM:" line.

TO: Vance Fong, Chief  
Quality Assurance Office (PMD-3)

The purpose of this memo is to request approval for the attached field sampling plan. Thank you for your assistance. If you need more information, please contact me at 4-2028.

Analysis: Perchlorate by ion chromatography (SOP #531)  
Matrix: Groundwater (Artesian well)  
Sampling Date: Sept. 23 1999 (samples will arrive @ lab via Fed Ex on 24 September)  
Turnaround: Standard  
Number of Samples: Maximum of 4 (including dupe and field blank)

cc (w/o attachment):  
Rich Bauer, PMD-2  
Gail Jones, PMD-3  
Rich Freitas, PMD-3

GROUNDWATER  
SAMPLING and ANALYSIS PLAN

Simi Valley Perchlorate  
Simi Valley, Ventura County, California

Prepared by:  
Katherine J. Baylor, Hydrogeologist  
United States Environmental Protection Agency  
Region IX  
75 Hawthorne Street  
San Francisco, CA 94105

8 September 1999

## **1.0 OBJECTIVE**

This one-time sampling event will be used to determine if perchlorate is present in groundwater at selected locations in Simi Valley, California. An artesian well in Simi Valley, located at 1672 Casarin Avenue, has been identified as containing perchlorate at a concentration of 4.7 ug/L.

Perchlorate will be analyzed at the EPA Region 9 laboratory in Richmond, California using Standard Operating Procedure #531 (perchlorate by ion chromatography). The intended sampling date is September 23, 1999.

## **1.1 DATA QUALITY OBJECTIVES**

The purpose of the analysis is to determine if perchlorate is present in groundwater near the Rocketdyne/SSFL site in Simi Hills, California. The groundwater is not used as potable water for human consumption, but is accessible to domestic animals (e.g., dogs and cats) and wildlife which may be present in the area, as the well to be sampled is artesian (free-flowing), and discharges to the street. The expected perchlorate concentration is low. The requested analysis will be perchlorate by ion chromatography, which has a detection limit near the health-based guidance level of 4-18 ug/L, which is adequate for this event.

## **2.0 BACKGROUND**

Background information for the Boeing (Rocketdyne Division) Santa Susana Field Laboratory site was obtained from the following documents:

"Annual Groundwater Monitoring Report, Santa Susana Field Laboratory, 1997" Groundwater Resources Consultants, Incorporated, dated February 1998

"Groundwater Monitoring Quarterly Report, Santa Susana Field Laboratory, Third Quarter" Groundwater Resources Consultants, Incorporated, dated November 1998

## **2.1 SITE LOCATION**

The Rocketdyne/SSFL site is located in the Simi Hills of eastern Ventura County, California (Figure 1). The geographic center of the site is approximately 34° 13' 45"N latitude and 118° 41' 30" W longitude.

The Rocketdyne/SSFL site occupies approximately 2700 acres in the Simi Hills. It is surrounded by residential areas and open space. The artesian well to be sampled is located at 1672 Casarin Avenue in Simi Valley, approximately four miles northwest of the Rocketdyne SSFL site.

## **2.2 SITE HISTORY**

The SSFL facility has been operated as a rocket engine testing facility since 1948. Seven major rocket engine test areas, including Bowl, Canyon, STL-IV, Alpha, Bravo, Coca and Delta, were in operation simultaneously in the late 1950's and early 1960's. Perchlorate was one of several rocket fuels used at the facility.

Perchlorate in Simi Valley became a concern due to sampling and analysis performed in March 1999 by Calleguas Municipal Water District. Initially, the City of Simi Valley installed groundwater wells in an attempt to de-water portions of Simi Valley which routinely experience flooding problems caused, in part, by a shallow water table. Rather than waste the extracted groundwater, the City offered it to Calleguas Water District, the local water purveyor. Calleguas, in turn, tested the extracted water to determine if it was potable or suitable for non-potable uses. High total dissolved solids (TDS) results (1300 mg/L), as well as nitrate (46 mg/L) and sulfate (480 mg/L) ruled out the potability issue, but in testing the water for a range of potential contaminants, Calleguas detected perchlorate at a concentration of 4.7 ug/L.

### **2.3 GEOLOGY**

The SSFL facility is located in the Simi Hills of eastern Ventura County, California. The Simi Hills are in the northern part of the Transverse Range geomorphic province and separate the Simi Valley from the western part of the San Fernando Valley. The Simi Valley is a broad east/west trending synclinal depression and the Simi Hills form the southern flank of the syncline.

The Simi Hills are composed primarily of exposures of the Upper Cretaceous Chatsworth Formation. This formation is a marine turbidite sequence of sandstone with interbedded siltstone/mudstone and minor conglomeritic lenses. The exposure of the Chatsworth Formation in the Simi Hills is characterized by massive, cliff-forming sandstone beds. The Upper Cretaceous Chatsworth Formation underlies most of the facility. It is composed primarily of well-consolidated, massively bedded sandstone with interbeds of siltstone and claystone. The sandstone portion of the formation is primarily an arkosic sandstone with carbonate cement. At the facility, the Chatsworth Formation beds dip to the northwest at approximately 20 to 30 degrees. Well-developed fractures and joints are present in Chatsworth Formation outcrops.

### **3.0 FIGURES AND TABLES**

Figure 1: Site Location map

Table 1: Request for Analysis Table

### **4.1 SAMPLE LOCATIONS AND NUMBER OF SAMPLES**

At least one, and possibly as many as three (3) water samples will be collected. In addition, one field duplicate sample will be collected. No trip blank will be collected, as the analyte (perchlorate) is non-volatile. An equipment blank will only be collected if re-usable (deconned) equipment is used to collect the samples. If feasible, samples will be collected directly from the artesian wellhead. If no other blank is collected, one field blank will be collected. The total number of samples is not expected to exceed six (6), as follows:

- 3 groundwater samples (incl. 1 double-volume lab QC sample)
- 1 field duplicate sample
- 1 field blank

The primary artesian well to be sampled was previously identified as containing perchlorate at a concentration of 4.7 ug/L. No information is available on well specifications, including the

depth of the well, screened interval, or subsurface geology. It is not known if the source of the perchlorate is Rocketdyne/SSFL, but Rocketdyne is known to have used perchlorate-containing rocket fuels over a period of many years. There may be other potential sources of perchlorate, but none have been identified to date.

#### **4.2 RATIONALE FOR ANALYSIS**

Perchlorate was used extensively at the Rocketdyne/SSFL site during several decades of operation. Perchlorate was identified in the artesian well which is the subject of this sampling event at a concentration of 4.7 ug/L. In order to confirm the presence of perchlorate in the well, the requested analysis will be EPA Region 9 SOP #531, perchlorate by ion chromatography.

#### **5.0 REQUEST FOR ANALYSES**

Up to six (6) water samples, including one duplicate and one equipment/field blank, will be analyzed at the EPA Region IX laboratory in Richmond, California for perchlorate by SOP #531.

#### **6.0 FIELD METHODS AND PROCEDURES**

##### **6.1 SAMPLE COLLECTION**

Water samples will be collected using disposable equipment only, or no equipment if the samples are collected directly from the wellhead. Samples will be Federal Expressed to the USEPA Laboratory in Richmond, CA for perchlorate by SOP #531. Each sample will be collected using the following method:

1. Samplers will don disposable latex gloves prior to collection of any sample. If possible, samples will be collected directly from the artesian wellhead and/or surface water locations without the use of a transfer vessel. The primary artesian well to be sampled (1672 Casarin Street) is described as being completed below a metal grate. The closest accessible point to the artesian wellhead will be sampled. Several unused VOC vials and decontaminated stainless steel pitchers, of various sizes, will be brought into the field and used as transfer vessels, if needed. VOC vials are purchased certified clean from the manufacturer, and may be used as transfer vessels to sample low-volume seeps. If reservoirs or surface water ponds are sampled, a stainless steel pitcher will be used to collect a sample. If a stainless steel pitcher is used, an equipment blank will be collected.
2. Perchlorate: Perchlorate samples will be collected in 125-ml or 250-ml volume polyethylene bottles. No chemical preservative will be used. Perchlorate samples will be chilled to 4°C immediately after collection. The cooler temperature will be maintained at 4°C during transport to the laboratory.
3. GPS: All samples will be geographically located with the aid of a global positioning system (GPS) receiver. If available, samplers will use GPS equipment which receives satellite and U.S. Coast Guard beacon data to obtain relatively accurate field data, and avoid the need for post-processing.

### Reference Samples

No reference samples will be collected, as no 'reference' location from the same geologic unit is available. Perchlorate is not naturally-occurring, so background concentrations should be non-detect. Although perchlorate has historically been used at the Rocketdyne/SSFL site, it is possible that other perchlorate sources are present in the Simi Valley area.

### Field Parameters

pH, temperature, electrical conductivity, dissolved oxygen, turbidity, and redox (oxygen-reduction potential) will be measured in the field, using field-portable instruments obtained from the Region 9 laboratory equipment storage facility. GPS locations will also be recorded in the field.

## **6.2 DISPOSAL OF CONTAMINATED MATERIALS**

All disposable sampling equipment (gloves, paper towels, etc.) will be bagged in plastic garbage bags for disposal to a non-hazardous waste landfill. There is no indication that sampling material will be contaminated with compounds which exceed regulatory limits for disposal to a Class III (solid waste) landfill.

## **6.3 DECONTAMINATION**

No field equipment decontamination will be necessary. Sampling equipment used in this event will consist primarily of disposable items such as unpreserved VOA vials, latex gloves, etc. Several stainless steel pitchers will be brought into the field and used, if necessary, as transfer vessels. These pitchers will be decontaminated at the EPA Region 9 laboratory in Richmond, California. Equipment decontamination will consist of a phosphate-free detergent wash, tap water rinse, 10% acid rinse, and de-ionized water rinse (twice). Decontaminated stainless steel pitchers will be wrapped in aluminum foil, and labelled with date and initials of the person performing the decontamination.

## **6.4 SAMPLE CONTAINERS**

The Request for Analysis table (Table 1) lists the containers that will be used for this sampling event. All containers have been purchased pre-cleaned and quality control checked, and will be obtained from the bottle repository at the Region 9 laboratory.

## **6.5 SAMPLE PRESERVATION**

All samples will be chilled with double-bagged ice to maintain a cooler temperature of less than 4°C. Perchlorate samples will not be chemically preserved, but will be chilled to 4°C.

## **6.6 SAMPLE SHIPMENT AND PACKAGING**

All samples will be shipped as low concentration environmental samples. Samples will be Fed-Exed to the Region 9 laboratory. The following procedures will be followed to ensure that the samples are intact when they arrive at the laboratory:

1. Custody seal all samples as they are collected, and log samples onto the EPA Region 9 chain

of custody (pink-and-white) form. Place the polyethylene bottles in a garbage bag-lined cooler. Add sufficient double-bagged ice to maintain a cooler temperature of 4°C. Fill cooler void spaces with styrofoam popcorn, or other sufficient cushioning material. Close and custody seal the garbage bag.

2. Enclose the first (white) copy of the chain of custody form in the ice chest by placing it inside a plastic ziploc-type bag and taping the bag to the inside of the cooler.
3. Seal the ice chest shut with strapping tape. Place two custody seals on the front and one on the back of the ice chest so that the custody seals extend from the lid to the main body of the ice chest. Place clear tape over each custody seal to protect it from accidental breakage. Seal the drain plug with duct tape.
4. Attach the completed Fed Ex label to the top of the cooler, and deliver to local Fed Ex office.
5. Call the Regional Sample Control Coordinator at (415) 744-1498 within 24 hours after sample shipment.

## **6.7 FIELD DOCUMENTATION**

Sampling Map: Each sample location will be logged and geo-referenced (GPS location) on a sampling map of the site, and relevant landmarks included.

Sampling Logsheet: This will be completed for each sample collected. Sampling log sheets will include information on GPS location, ambient conditions, depth of sampling, sample numbers, field parameters, and any unusual colors or odors.

Chain of Custody Paperwork: Chain of custody forms and field QA/QC summary forms will be filled out for all samples collected. A chain of custody form will be completed for each cooler; the original (white) copy will be shipped with the cooler, and the duplicate (pink) copy will be retained by the sampling team leader. All chain of custody forms and custody seals will be signed and dated by a member of the sampling team.

Sample Labels: Each bottle will be labelled with a sample number, case number, date of collection, type of analysis, preservative, and sampler. Duplicate samples will be assigned similar numbers and sent "blind" to the laboratory. All sample numbers and locations (including dupes) will be recorded on the sampling log.

## **6.8 QUALITY CONTROL SAMPLES**

### **6.8.1 FIELD DUPLICATES**

Duplicate samples will be collected at the rate of one per ten samples. For this event, it is expected that only one duplicate sample will be collected. For this event, the duplicate sample will be collected at the Casarin Avenue artesian well, the subject of this investigation. The duplicate sample will be collected by filling both bottles (sample and duplicate) simultaneously.



Each sample from a duplicate set will have a unique sample number; the duplicates will be sent "blind" to the lab.

#### **6.8.2 BLANK SAMPLES**

No trip blank sample will be collected, as trip blanks are used for VOC, rather than perchlorate samples. If deconned equipment (e.g., stainless steel pitcher) is used to collect any sample, an equipment blank will be collected prior to collection of the environmental sample. The equipment blank will be collected by pouring blank (de-ionized (DI) or DI-distilled water) water into the deconned pitcher, then pouring that water from the pitcher into the sample container. The blank sample will have a unique sample number, and will be sent "blind" to the lab. If no other blank is collected, one field blank will be collected.

#### **6.8.3 LAB QC SAMPLE**

A double-volume lab QC sample will be collected at the Casarin Avenue well. Two sample bottles will be filled simulataneously, labelled with the same sample ID number and "LAB QC." The lab QC sample will also be identified on the chain-of-custody form.

#### **7.0 HEALTH AND SAFETY PLAN**

No health and safety plan is required for this event, as the contaminants are expected to be low level.

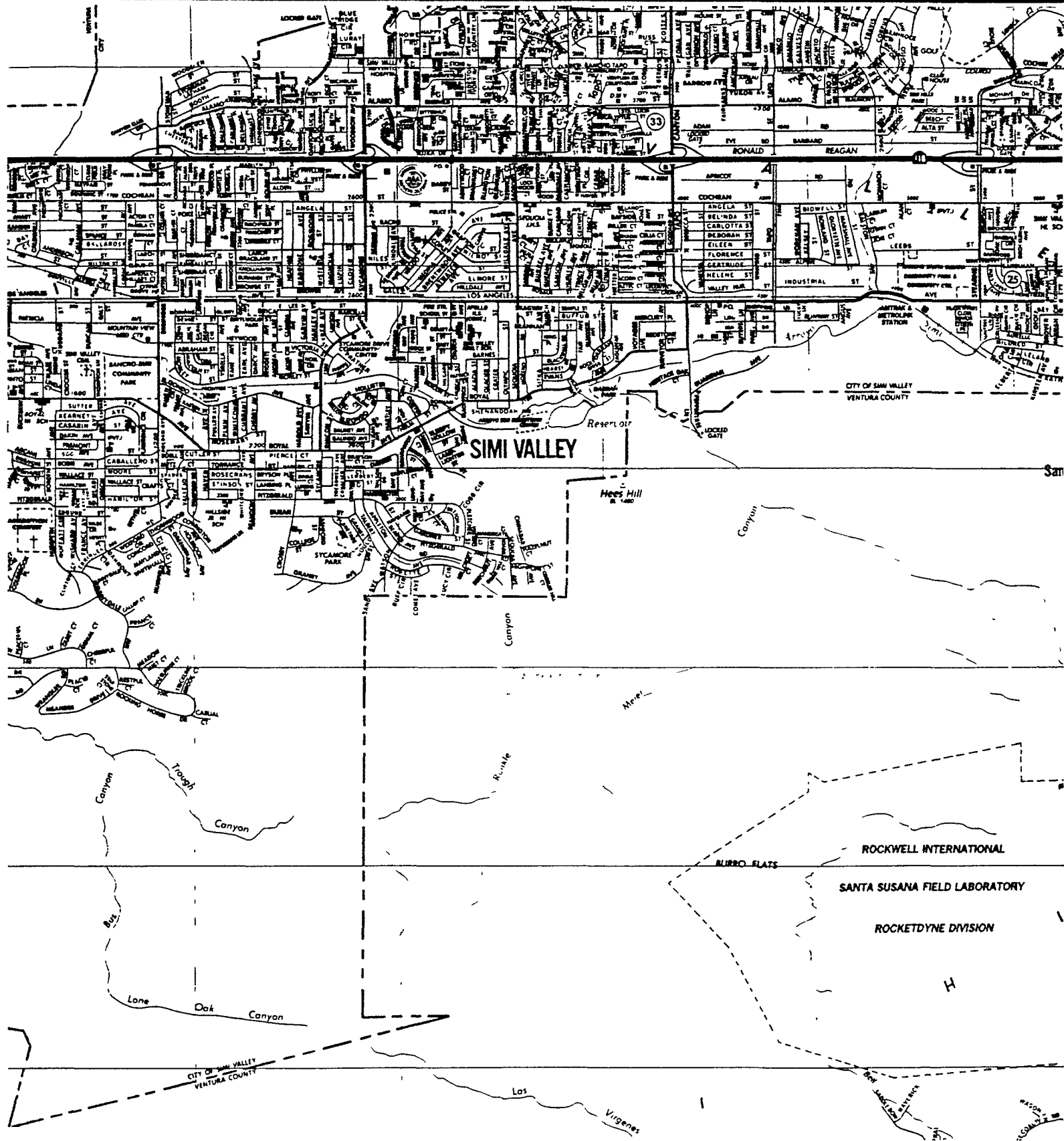


Figure 1. Well Location Map

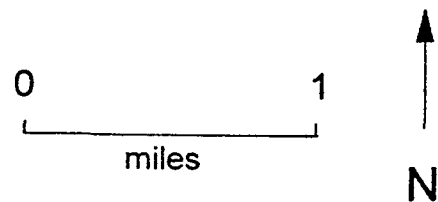


Table 1

## REQUEST FOR ANALYSIS TABLE

| SITE                           |                     | Simi Valley Perchlorate           |                              |                       |
|--------------------------------|---------------------|-----------------------------------|------------------------------|-----------------------|
| CHEMISTRY TYPE                 |                     | INORGANICS                        |                              |                       |
| ANALYSES REQUESTED<br>Matrix   |                     | Perchlorate<br>(Groundwater)      |                              |                       |
| PRESERVATIVES                  |                     | Chill to 4C                       |                              |                       |
| ANALYTICAL<br>HOLDING TIME(S)  |                     |                                   |                              |                       |
| CONTRACTUAL<br>HOLDING TIME(S) |                     |                                   |                              |                       |
|                                |                     | # OF BOTTLES<br>PER ANALYSIS      | # OF BOTTLES<br>PER ANALYSIS |                       |
| SAMPLE<br>LOCATION             | SAMPLING<br>DATE(S) | 1 x 250 ml<br>polyethylene bottle |                              | TOTAL #<br>OF BOTTLES |
| Casarin Ave well               | 9/23/99             | LAB QC                            |                              |                       |
|                                |                     | 2                                 |                              | 2                     |
| Casarin Ave dupe               | 9/23/99             | 1                                 |                              | 1                     |
| Field or Equip Blank           | 9/23/99             | 1                                 |                              | 1                     |
| Reservoir / Other              | 9/23/99             | 1                                 |                              | 1                     |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
|                                |                     |                                   |                              |                       |
| TOTAL #<br>OF BOTTLES          |                     | 5                                 |                              | 5                     |